

WE CLAIM:

1. A method of allocating bandwidth in a first node that is operable in an ad hoc, wireless network configured to support at least one guaranteed feasible flow allocation, the method comprising the steps of:
 - initiating a communication between the first node and a second node in the network that, together, are endpoints of a link, the communication being related to possible bandwidth allocation adjustment of a flow sharing the link;
 - determining, in the first node, a first new bandwidth allocation that approaches a first optimization condition for the flow;
 - communicating with the second node to determine a mutually-agreed upon optimal bandwidth allocation for the flow;
 - notifying neighbor nodes in the network of the mutually-agreed upon optimal bandwidth allocation when reallocation is needed; and
 - adopting the mutually-agreed upon optimal allocation for the flow when reallocation is needed.
2. The method of claim 1, further comprising the step of:
 - re-performing the initiating, determining, communicating, notifying, and adopting steps at a later point in time.
3. The method of claim 1 wherein the determining step comprises determining, in the first node, a first new bandwidth allocation that approaches at least one of a Max Min Fair condition and a Quality of Service guarantee condition.
4. The method of claim 1, wherein the initiating step comprises initiating

a communication between the first node and the second node in a slotted, ad hoc, wireless network.

5. The method of claim 1, wherein the initiating step comprises initiating a communication between the first node and the second node in a network on which a Time Division Multiple Access (TDMA) schedule is implemented.

6. A network device configured to allocate bandwidth in an ad hoc, wireless network configured to support at least one guaranteed feasible flow allocation, the device comprising:

- a first communication unit configured to initiate a communication between the device and a node in the network that, together, are endpoints of a link in the network, the communication being related to possible bandwidth allocation adjustment of a flow sharing the link;

- a first processing unit configured to determine a first new bandwidth allocation that approaches a first optimization condition for the flow, wherein the first processing unit is operably connected to the first communication unit;

- a second communication unit configured to communicate with the node to determine a mutually-agreed upon optimal bandwidth allocation for the flow, wherein the second communication unit is operably connected to the first communication unit;

- a third communication unit configured to notify neighbor nodes in the network of the mutually-agreed upon optimal bandwidth allocation when reallocation is needed, wherein the third communication unit is operably connected to the first communication unit; and

- a second processing unit configured to adopt the mutually-

agreed upon optimal allocation for the flow when reallocation is needed, wherein the second processing unit is operably connected to the first communication unit.

7. A computer program embodied on computer-readable media, with the computer program configured to allocate bandwidth in an ad hoc, wireless network configured to support at least one guaranteed feasible flow allocation, the computer program comprising:

- a first sub-routine for initiating a communication between the first node and a second node in the network that, together, are endpoints of a link, the communication being related to possible bandwidth allocation adjustment of a flow sharing the link;

- a second sub-routine for determining, in the first node, a first new bandwidth allocation that approaches a first optimization condition for the flow;

- a third sub-routine for communicating with the second node to determine a mutually-agreed upon optimal bandwidth allocation for the flow;

- a fourth sub-routine for notifying neighbor nodes in the network of the mutually-agreed upon optimal bandwidth allocation when reallocation is needed; and

- a fifth sub-routine for adopting the mutually-agreed upon optimal allocation for the flow when reallocation is needed.

8. A network device configured to allocate bandwidth in an ad hoc, wireless network configured to support at least one guaranteed feasible flow allocation, the device comprising:

- initiation means for initiating a communication between the first node and a second node in the network that, together, are endpoints of a link, the communication being related to possible

bandwidth allocation adjustment of a flow sharing the link;

determination means for determining, in the first node, a first new bandwidth allocation that approaches a first optimization condition for the flow;

determination means for communicating with the second node to determine a mutually-agreed upon optimal bandwidth allocation for the flow;

notification means for notifying neighbor nodes in the network of the mutually-agreed upon optimal bandwidth allocation when reallocation is needed; and

adoption means for adopting the mutually-agreed upon optimal allocation for the flow when reallocation is needed.